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Ilyocryptus verrucosus Daday, 1905: a junior synonym of I. spinifer Herrick, 1882 (Crustacea: Cladocera)

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ABSTRACT. The type material of Ilyocryptus verrucosus Daday, 1905 has been compared with South American sexual females of I. spinifer. The species name verrucosus Daday, 1905 is found to be invalid and the junior synonym of I. spinifer Herrick, 1882. The ephippium of the South American I. spinifer is described with some remarks.

KEY WORDS: Ilyocryptus verrucosus, I. spinifer, junior synonym, ephippium, redescription

1. INTRODUCTION

The Hungarian zoologist Dr. Jenő DADAY de Deés described the species Ilyocryptus verrucosus from Paraguay (DADAY, 1905). No other specimens of this species have been collected and mentioned in the literature from that time. STINGELIN (1913) described the populations of I. halyi var. longiremis (now the junior synonym of I. spinifer Herrick, 1882) from Colombia and he reported some specimens with granulation of the valves which resemble DADAY's species, I. verrucosus. Prof. SMIRNOV in his monograph (1976) reported the type material of I. verrucosus and he commented that the granulation of the valves - a key character of the species - is inadequately figured in the original description. In fact the depressions and the protrusions are not so marked. The eiphippium of I. spinifer was first described by SARS (1901) from mud samples collected near Sao Paulo and Itatiba, Brazil. A comparison of the material from Trinidad, the type material of I. verrucosus and the description and figure of the ephippium given by SARS (1901) result in the conclusion that the species I. verrucosus Daday, 1905 is not a valid species.

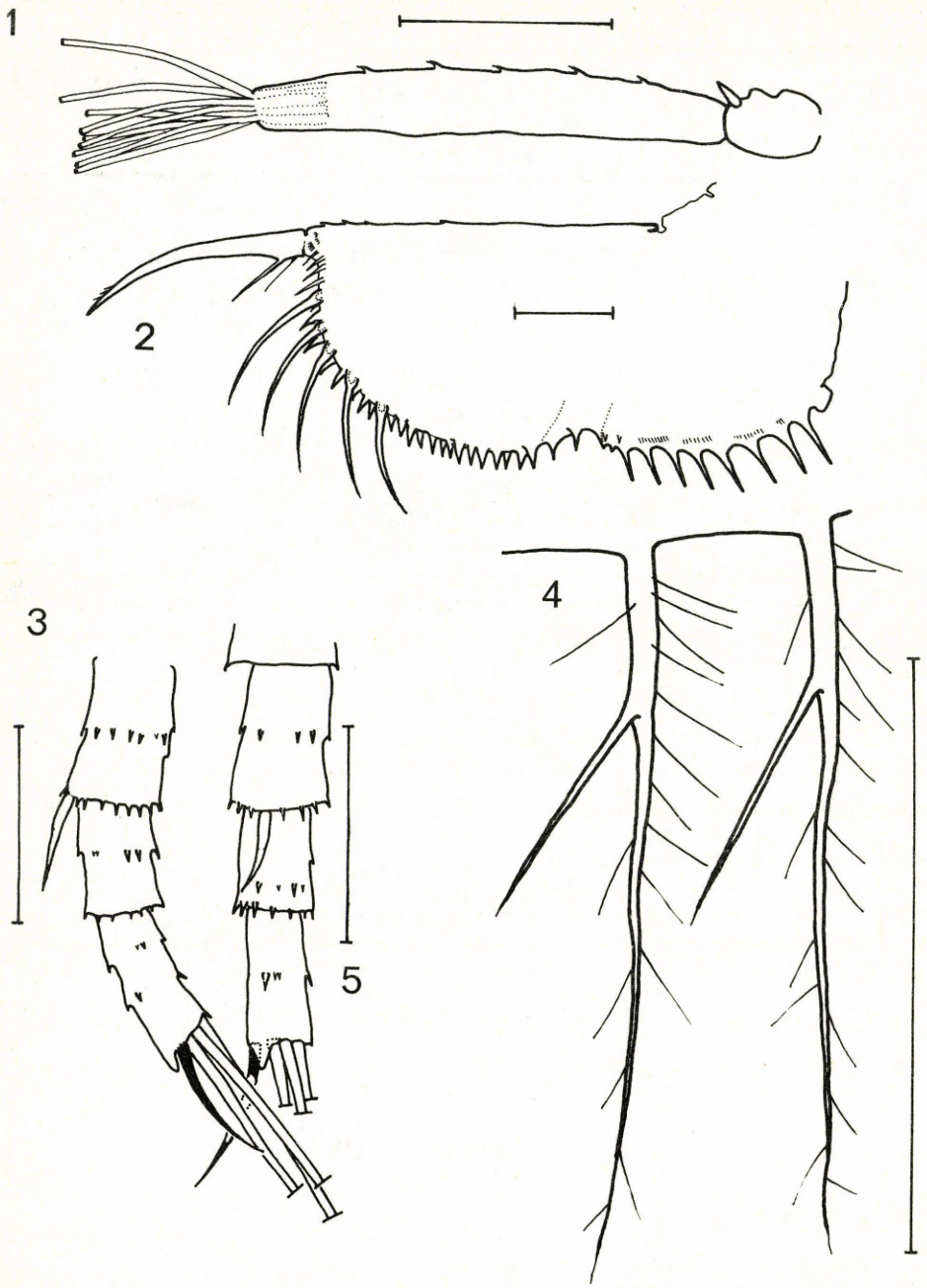
MATERIAL AND METHODS

Material examined:

1. I. verrucosus Daday, 1905: LECTOTYPE (designated by Dr. L. FORRÓ), one female in alcohol, Paraguay, (D 1917-26; II-454).
2. I. verrucosus Daday, 1905: PARALECTOTYPES (designated by Dr. L. FORRÓ), five females (one dissected) on slide, Paraguay, (D III-50; II/P-404).
3. I. halyi (= I. spinifer Herrick, 1881), parthenogenetic female and male (?) on slide, Paraguay, (III-52; II/P-403).
4. I. halyi, parthenogenetic female on slide, Paraguay, (III-51; II/P-402), in poor condition.

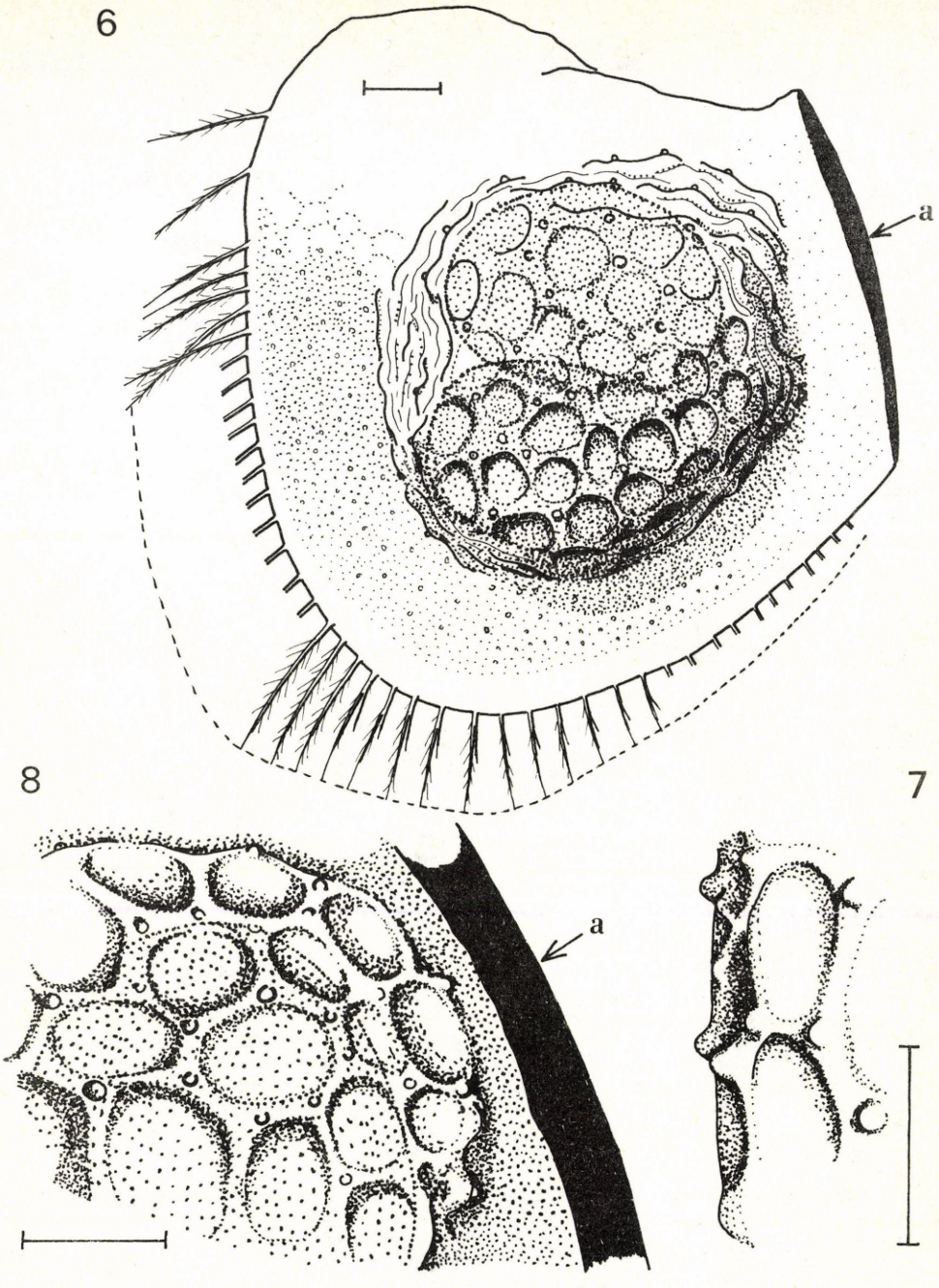
1-4: from DADAY's collection in the Hungarian Natural History Museum, Budapest, Hungary.

5. I. spinifer Herrick, 1882, eight sexual females and 14 parthenogenetic females on five slides, Trinidad (South), Waterloo Road, 23.2.1979, leg. T. GOPEE.



Figs 1-4. Ilyocryptus spinifer Herrick, 1882, sexual female, Paraguay, Daday's collection (D III-50; II/P-404) (1= antennule, 2= postabdomen, 3= distal segments of antennal exopod, 4= defensive posterior spines of carapace)

Fig. 5 Ilyocryptus spinifer Herrick, 1882, sexual female, Trinidad (South), Waterloo Road, 23.2.1979, leg. T. Gopee, distal segments of antennal exopod



Figs 6-7 Ilyocryptus spinifer Herrick, 1882, sexual female, Paraguay, Daday's collection (D III-50; II/P-404) (6= ephippium, 7= details of the ephippium)

Fig. 8 Ilyocryptus spinifer Herrick, 1882, sexual female, Trinidad (South(, Waterloo Road, 23.2.1979, leg. T. Gopee, part of the ephippium (a= chitinized part of carapace. Scale equals 0.05 mm)

6. I. spinifer Herrick, 1882, one sexual female and three parthenogenetic females on two slides, Trinidad, label destroyed, 1979, leg. T. GOPEE.
7. I. spinifer Herrick, 1882, sexual female on slide, Sri Lanka, Hungama, Mulanawewa (small lake), 14.2.1980, leg. R. RAJAPAKSA.
8. I. spinifer Herrick, 1882, three ephippia on slide, Sri Lanka, Marawila (pond), 5.5.1973, leg. C.H. FERNANDO.
9. I. spinifer Herrick, 1882, two sexual females on slide, Zambia, Middle Kafue region, Ngoma, 21.4.1965 (No. 11533), leg. J.J. SYMOENS.

5-9: slides are deposited in Dr. V. KORINEK's collection, Dept. of Parasitology and Hydrobiology, Charles University, Prague, Czechoslovakia.

Methods

Selected specimens were stained with a mixture of lignin pink and chlorazol black E in ethylene glycol (BRANDLOVA et al., 1972) and mounted in Canada balsam, and some specimens were mounted in polyvinyl alcohol (SMIRNOV, 1976) stained by lignin pink. Animals were measured and figured using a Biolar binocular microscope (made in Poland). The scale on the figures equals 0.05 mm.

RESULTS

1. Comparison of I. verrucosus Daday, 1905 with the sexual females of I. spinifer Herrick, 1882

In the original description DADAY (1905) wrote about the relationships between the new species I. verrucosus and others: (p. 192) " ... Von den bisher bekannten Arten der Gattung steht die neue Art am nächsten zu Iliocryptus Halyi Brad., dem sie durch die Struktur des Postabdomens, sowie des ersten und zweiten Antennenpaares gleicht; sich aber durch die Struktur der Schale nicht nur von dieser, sondern auch von allen übrigen Arten der Gattung wesentlich unterscheidet."

DADAY mentioned that the characters antennula, antenna and postabdomen are similar to those of I. halyi (a junior synonym of I. spinifer Herrick, 1882). On the contrary, the hollowed surface of the valves (= granulation) is said to be the specific character of the species I. verrucosus Daday, 1905.

In the present study of Daday's material from Paraguay (I. verrucosus) and the sexual females of I. spinifer from Trinidad, it is shown that neither populations can be distinguished by using the morphology of the antennule, the antenna, the postabdomen and the defensive posterior spines on the shell margin. These characters are depicted (Figs 1-5). Both populations are identical in further two characters: the granulation of the shell (Figs 6-8) and one-layered carapace. These two characters are typical for the sexual female. One-layered carapace is the result of perfect molting before sexual reproduction (there are two species, I. acutifrons and I. agilis in which perfect moulting is typical for the whole life). The granulated carapace surface is specific for the ephippium of the genus Ilyocryptus (CHIRKOVA and MAKRUSHIN, 1982). Similarity or identity of all these characters is a reason why the species I. verrucosus Daday, 1905 is synonymized with I. spinifer Herrick, 1882 as its junior synonym.

DADAY (1905) listed the localities of I. verrucosus as Paraguay, Asuncion: Campo Grande, Calle de la Canada. It is interesting that Daday identified also the parthenogenetic females of I. halyi (= I. spinifer) from the same localities.

We can assume that Daday sorted the population of I. spinifer into two groups. The first group (parthenogenetic females) he identific as I. Halyi (= I. spinifer) and the second group (sexual females) was described as a new species I. verrucosus.

2. Ephippium of the South American I. spinifer

a) Description (Figs 6-8)

The ephippium is produced by the shell of the female before sexual reproduction. Reticulations are distinct around the centre of the ephippium where areas of cells are slightly de-

pressed, margins of cells are thickened with knob-like projections mostly at the points where three or four cells are contiguous. Defensive posterior spines and plumose setae are partially retained along the shell margin. The ephippium constains up to two eggs (mostly two).

b) Remarks

This description is based on the South American material and agrees with the brief description and figure published by SARS (1901) from Brazil. African material and material from Sri Lanka (see material examined; published by KORINEK (1984) and RAJAPAKSA and FERNANDO (1982) respectively) have not only the knob-like projections but rather column- or cone-like projections in the centre of the ephippium.

CONCLUSIONS

Ilyocryptus verrucosus Daday, 1905 is a junior synonym of I. spinifer Herrick, 1882. The sexual females of I. spinifer were used for the description.

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